



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q61045

Fumiyoshi ONO

Appln. No.: 09/672,776

Group Art Unit: 1765

Confirmation No.: 2256

Examiner: Charlotte A. Brown

Filed: September 29, 2000

For: COMPOSITION FOR POLISHING METAL ON SEMICONDUCTOR WAFER AND
METHOD OF USING SAME

RESPONSE

Commissioner for Patents
Washington, D.C. 20231

Sir:

This Response is submitted to the Office Action dated October 31, 2002, in which the Examiner set a three-month period for response.

Claims 6-9 are all the claims pending in the application.

The Examiner has not acknowledged Applicant's claim to priority under 35 U.S.C. § 119, nor indicated that the certified copies of the priority documents have been received. Priority is claimed from May 19, 1998, and April 22, 1999, based on JP Application Nos. 10-136934, and 11-115158, respectively. The priority documents were filed in parent Application No. 09/313,356. Also, benefit is claimed from Provisional Applications 60/102,000 and 60/132,426 filed September 28, 1998, and May 4, 1999, respectively.

Therefore, Applicant respectfully requests that the Examiner formally acknowledge Applicant's claim to foreign and domestic priority under 35 U.S.C. § 119 and receipt of the certified copies of the priority documents.

BEST AVAILABLE COPY

RECEIVED
FEB - 4 2003
1700 MAIL ROOM

RECEIVED
FEB - 4 2003
1700 MAIL ROOM

RESPONSE

U.S. Application No.: 09/672,776

I. Rejection of Claims 6-9 Under 35 U.S.C. § 103(a)

On pages 2-3 of the Office Action, the Examiner rejected claims 6-9 under 35 U.S.C. § 103(a) as being unpatentable over Kasai et al. (U.S. Patent 6,007,592) in view of Garg et al. (U.S. Patent 6,258,137).

The present invention is directed to a method for polishing using a polishing composition comprising alumina fine particles containing or not containing aluminum hydrate, a polishing accelerator and water, said alumina fine particles having an α conversion ratio of from 65 to 90% and a specific surface area of from 30 to 80 m²/g.

The Examiner relies on Kasai for apparently the same reasons as in the previous Office Action. The Examiner asserted that Kasai et al. discloses an alumina particle with an α -phase content of 80-90%, which reads on Applicant's " α -conversion rate of 65-90%". In addition, the Examiner appears to have taken the position that since Garg et al. discloses α -alumina particles having a BET surface area of at least 50 m²/g, the present invention is obvious.

Applicant respectfully traverses this rejection for the following reasons.

The Examiner acknowledges that Kasai does not teach a method in which alumina particles have a specific surface area of from 31 to 77 m²/g.

The Examiner cites Garg as disclosing chemical mechanical polishing (CMP) processes and products, where the process comprises polishing a substrate comprising metal and a non-conductive material using an abrasive that comprises an alumina powder. The Examiner asserts that the powder has a BET surface area of at least 50 m²/g and the alumina has an α -alumina content of at least 90% by weight. Therefore,

RESPONSE

U.S. Application No.: 09/672,776

the Examiner takes the position that one of ordinary skill in the art would have found it obvious to modify Kasai with a specific surface area as taught by Garg to provide an abrasive that will remove metal selectively and slowly such that dishing can be minimized (col. 1, lines 60-64).

In response, Applicant emphasizes the unexpected superior results of the present invention based on the Declaration executed by Hajime Sato under 37 C.F.R. § 1.132, which was filed in parent application no. 09/313,356 (a copy of the Declaration was filed on August 22, 2001 in the present application, and another copy is submitted herewith for the Examiner's convenience). The Declaration shows that the present invention provides superior results compared to compositions with specific surface areas outside the claimed range.

Applicant prepared compositions containing alumina particles where the surface area and/or the α -conversion are outside the claimed ranges of 30 m²/g to 80 m²/g and 65%-90%, respectively. As shown in the Table of the Declaration, when the surface area of the alumina is less than 30 m²/g or more than 80 m²/g, or when the α -conversion is less than 65% or more than 90%, an increase in scratches, reduction in selection ratio and/or reduction in polishing rate were observed.

The features of the present invention should be considered together. In particular, the present invention requires that the alumina fine particles have an α -conversion ratio of 65-90 % and a surface area of 30-80 m²/g. Accordingly, when the composition contains alumina fine particles having both features, the composition provides unexpectedly superior results compared to compositions with an α -conversion ratio or surface area outside the claimed range. In addition, the effects of

RESPONSE

U.S. Application No.: 09/672,776

* (the present invention could not be expected from Kasai, which does not teach or suggest that the surface area of the particles has any effect on the composition.

Accordingly, the present invention provides unexpectedly superior results.

In addition, Applicant respectfully submits that Applicant is not required to compare the claimed invention with subject matter that does not exist in the prior art, and that Applicant has shown that the present invention provides unexpectedly superior results over Kasai. In this regard, Applicant directs the Examiner's attention to *In re Chapman*, in which the Court held that requiring Applicants to compare the claimed invention with the polymer suggested by the combination of references relied upon in the rejection of the claimed invention under 35 U.S.C. § 103 "would be requiring comparison of the results of the invention with the results of the invention." *See also* MPEP §716.02(e). In this regard, Applicant points out to the Examiner that Applicant is not required to compare the claimed invention with subject matter not disclosed in the prior art (i.e., the combination of Kasai and Garg).

Additionally, Applicant asserts that one of ordinary skill in the art would not be motivated to combine Kasai and Garg. Garg relates to a CMP process and product employing alumina comprising α -alumina particles having a silica coating and a BET surface area of at least 50 m²/gm (See col. 1, line 65 to col. 2, line 9). The alumina particles are formed by dispersing silica in a boehmite gel material, which forms a barrier around the boehmite particles, then drying and firing the gel at a temperature to convert at least the major proportion of the alumina to the α -phase (*See* col. 4, lines 10-19).

RESPONSE

U.S. Application No.: 09/672,776

On the other hand, Kasai discloses the use of α -alumina fine particles (*See* col. 2, lines 15-18). The alumina of Kasai does not have a coating, and specifically, the alumina does not have a silica coating.

Therefore, one of ordinary skill in the art would not modify the particles of Kasai. That is, since Garg relates to silica coated alumina particles and Kasai does not, one of ordinary skill in the art would not be motivated to obtain particles of Kasai having a specific surface area of at least $50 \text{ m}^2/\text{g}$ because the benefits derived from the particles of Garg are due to silica coated alumina. One ordinarily skilled in the art would not be motivated to combine the cited references because Garg teaches against the use of an uncoated α -alumina particle in the composition (and teaches for the use of a silica coated α -alumina particle in the composition), such that one would not have applied Garg's teachings to Kasai's uncoated α -alumina.

In addition, as noted above, a person of ordinary skill in the art would not expect the unexpectedly superior advantages of the alumina particles with an α -conversion of 65%-90% and a specific surface area of $30 \text{ m}^2/\text{g}$ to $80 \text{ m}^2/\text{g}$ of the present invention.

Accordingly, the present invention is not obvious, especially in light of the importance of the α -conversion ratio for achieving the desired effects of the composition. Therefore, Applicant respectfully submits that Kasai et al. and Garg et al. fail to teach or suggest the present invention, and respectfully requests that the rejection be withdrawn.

RESPONSE

U.S. Application No.: 09/672,776

II. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE



23373

PATENT TRADEMARK OFFICE

Keiko K. Takagi / Bruce E. Kame
Keiko K. Takagi
Registration No. 47,121

Date: January 31, 2003